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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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|-----------------|-------------|----------------------|---------------------|------------------|

10/729,582

12/06/2003

Benjamin Jian

AFC-002/RE

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02/16/2005

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EXAMINER

KANG, JULIANA K

ART UNIT

PAPER NUMBER

2874

DATE MAILED: 02/16/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

| | | | |
|------------------------------|--------------------------------------|---------------------------------------|--|
| Office Action Summary | Application No. 10/729,582 | Applicant(s) JIAN, BENJAMIN | |
| | Examiner Juliána K. Kang | Art Unit 2874 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-38 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-38 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. ____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|--|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s)/Mail Date. ____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date <u>12/6/03</u> . | 6) <input type="checkbox"/> Other: ____ |

Reissue Applications

1. The present application is a reissue of United States Patent 6,328,482 which issued on December 11, 2001, and which matured from United States Application Serial Number 09/327,826, filed on June 8, 1999. This reissue application was filed within two (2) years from the grant of the original patent, and seeks to enlarge the scope of the claims of the original patent.
2. The Examiner's search has found that neither the original patent nor the present reissue application is involved in any pending litigation. If this finding is in error; applicant should notify the Patent and Trademark Office of the pending litigation as a part of the response to this Office action.
3. The original patent has not expired, as the first required maintenance fee was timely paid on December 13, 2004.
4. The reissue oath/declaration filed with this application is defective because it fails to identify at least one error which is relied upon to support the reissue application. See 37 CFR 1.175(a)(1) and MPEP § 1414.
5. Claims 30-38 are rejected as being based upon a defective reissue declaration under 35 U.S.C. 251 as set forth above. See 37 CFR 1.175. The error given in the declaration is improper under MPEP section 1414. The declaration must specifically identify an error. It is insufficient to merely state that the error was the failure to include new claims 30-38 directed to material disclosed. The declaration should state what specific limitation was previously claimed that is no longer being claimed because applicant believes it is not necessary for patentability.

6. Applicant has offered to surrender the original patent granted in U.S. Patent 6,328,482.

The amendment filed on December 6, 2003 does not comply with 37 CFR 1.173(d), which sets forth the manner of making amendments in reissue applications. All changes should be made with brackets and underlining relative to the patent. Thus, all new claims should always be totally underlined in accordance with 37 CFR 1.173 (d). A supplemental paper correctly amending the reissue application is required.

7. Claims 30-38 are rejected under 35 U.S.C. 251 as being an improper recapture of broadened claimed subject matter surrendered in the application for the patent upon which the present reissue is based. See *Pannu v. Storz Instruments Inc.*, 258 F.3d 1366, 59 USPQ2d 1597 (Fed. Cir. 2001); *Hester Industries, Inc. v. Stein, Inc.*, 142 F.3d 1472, 46 USPQ2d 1641 (Fed. Cir. 1998); *In re Clement*, 131 F.3d 1464, 45 USPQ2d 1161 (Fed. Cir. 1997); *Ball Corp. v. United States*, 729 F.2d 1429, 1436, 221 USPQ 289, 295 (Fed. Cir. 1984). A broadening aspect is present in the reissue which was not present in the application for patent. The record of the application for the patent shows that the broadening aspect (in the reissue) relates to subject matter that applicant previously surrendered during the prosecution of the application. Accordingly, the narrow scope of the claims in the patent was not an error within the meaning of 35 U.S.C. 251, and the broader scope surrendered in the application for the patent cannot be recaptured by the filing of the present reissue application. Claims 30-33 are essentially same as the original claims 1, 6, 7, 10, 13 and 14, which are surrendered by applicant. Claims 34-38 are essentially same as the original method claims 19-29.

Such broader claim scope surrendered in the application for the patent cannot be recaptured by the filing of the present reissue application.

Claim Rejections - 35 USC § 102

8. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

9. Claims 30-33 are rejected under 35 U.S.C. 102(b) as being anticipated by Matsuda (U.S. Patent 5,434,939).

Regarding claims 30 and 33, Matsuda disclose an optical fiber module comprising a first layer (203) having a socket (216) extending through the first layer and fiber socket sized to receive and align an optical fiber (216) (see Fig. 2).

Regarding claim 31, Matsuda shows a plurality of sockets (see Fig. 3c).

Regarding claim 32, Matsuda shows a second layer (202) that is affixed to the first layer (see Fig. 2).

10. Claims 30-35, and 37 are rejected under 35 U.S.C. 102(b) as being anticipated by Konishi et al (JP 06-138341).

Konishi et al disclose the claimed coupler comprising a first layer (5) said first layer having a plurality of sockets (16) formed by photolithographic masking and etching to extend through said first layer, said fiber socket sized to receive and align an optical

fiber therein. Konishi et al disclose that the first layer (5) and a second layer (4) that are pasted to each other.

Claim Rejections - 35 USC § 103

11. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

12. Claims 1-7, and 10-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Konishi et al (JP 06-138341).

Regarding claims 1, Konishi et al disclose an optical coupler comprising: a first layer (5, silicon guide plate), said first layer defining a fiber socket (16) formed by photolithographic masking and etching to extend through said first layer (see [0016]), said fiber socket sized to receive and align said optical fiber therein (see [0014]); a second layer (11, transparent substrate) bonded (pasted) to said first layer (see [0015]), said optical fiber having an end section that extends through the fiber socket, said optical fiber terminating at an end face situated approximately adjacent to the second layer and said fiber socket aligning and positioning said optical fiber therein. Konishi et al disclose that the second layer is transparent substrate. However, Konishi et al do not specifically teach that the second layer has the refractive index that is substantially equal to the refraction index of the optical core. When coupling optical beam between an optical fiber and optical element, using a material having refractive index that is

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substantially equal to the refractive index of the optical core would provide the efficient optical coupling without spreading light beam between the optical fiber and the optical element. Thus, it would have been obvious to one having ordinary skill in the art at the time the invention was made to use the second layer with the refractive index that is substantially equal to the optical fiber core in Konishi et al in order to improve the optical coupling efficiency.

Regarding claim 2, Konishi et al do not specific teach that the optical fiber is a single mode fiber. Using a single mode optical fiber is well known in the art. Since Konishi et al teach making the socket almost equal to the outer diameter of the optical fiber and not specify the types of optical fibers, using any type of optical fiber including a single mode optical fiber would have been obvious to one having ordinary skill in the art.

Regarding claim 3, Konishi et al disclose that the first layer is a single-crystal silicon layer (see [0009]).

Regarding claims 4 and 5, Konishi et al does not teach that the second layer comprises silicon or glass. It would have been obvious to one having ordinary skill in the art at the time the invention was made to use either a silicon or glass for the second layer in Konishi et al, since it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice.

Regarding claim 6, Konishi et al teach fitting and adhering the optical fiber in the socket formed in the first layer and pasting the first layer to the second layer. This arrangement provides an epoxy between the optical fiber (first layer) and the second

layer. Using the epoxy having an index of refraction that matches the index of the optical fiber in Konishi et al would have been obvious to one having ordinary skill in the art to provide the efficient optical coupling.

Regarding claim 7, as described above Konishi et al teach all the claimed limitations including an optical device (12) integrated into the second layer.

Regarding claims 10 and 11, as described above Konishi et al teach the claimed limitations including optical focusing element (12) having focal points approximately situated along the central axes of the fiber socket (see Fig. 1). However, Konishi et al do not teach that the focusing element is a gradient-index lens. A gradient-index lens is commonly used in the art to focus the light beam. Thus, using a gradient-index lens in Konishi et al would have been obvious to one having ordinary skill in the art at the time the invention was made to focus the light.

Regarding claim 12, Konishi et al do not specific teach that the optical fiber is a single mode fiber. Using a single mode optical fiber is well known in the art. Since Konishi et al teach making the socket almost equal to the outer diameter of the optical fiber and not specify the types of optical fibers, using any type of optical fiber including a single mode optical fiber would have been obvious to one having ordinary skill in the art.

Regarding claim 13, Konishi et al show a diffractive lens (12, see Fig. 1).

Regarding claims 14-17, as described above, Konishi et al teach all the claimed limitations except a third layer bonded to the second layer wherein the third layer comprising an optical device such as a VCSEL or focusing element. Since Konishi et al teaches further coupling of a semiconductor laser (1) and a focusing element (2), using

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additional layer to accommodate optical device such as VCSEL or lenses in Konishi et al would have been obvious to one having ordinary skill in the art at the time the invention was made to make the device more compact and easier to align.

13. Claims 7-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Matsuda (U.S. Patent 5,434,939).

Regarding claims 7-9, Matsuda teaches an optical coupler for coupling optical radiation between an optical device and an optical fiber, comprising: a first layer (203), said first layer defining a fiber socket (216) extending through the first layer, said fiber socket sized to receive and align said optical fiber therein; a second layer (202); said optical fiber (217) having an end section that extends through the fiber socket, said optical fiber terminating at an end face situated approximately adjacent to the second layer, said fiber socket aligning and positioning said optical fiber therein; and an optical device (204, 205, VCSEL) integrated into said second layer (see Fig. 2). Even though Konishi et al is silent about bonding the second layer to the first layer, bonding the two layers of Konishi et al would have been to one with ordinary skill in the art at the time the invention was made to make the structure sturdier. Using a photodetector is necessary for detecting and further processing of optical signals. Thus, placing a photodetector in Konishi et al would have been obvious to detect or process optical signals with efficient optical coupling.

14. Claims 18 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Matsuda and further in view of Kakii et al (EP 0 405 620 A2).

Matsuda teaches all the claimed limitations except dicing a composite wafer (bonded first and second layer). Kakii et al teach making a plurality of optical fiber coupling member by dicing substrate plate wafer comprising optical fiber coupling members into a plurality of chips of optical fiber coupling members. It would have been obvious to one having ordinary skill in the art at the time the invention was made to use the method of dicing the wafer into a plurality of chips of optical coupler for massive production of couplers with low manufacturing cost.

15. Claims 20-29, 36 and 38 are rejected under 35 U.S.C. 103(a) as being unpatentable over Konishi et al and further in view of Kakii et al (EP 0 405 620 A2).

Konishi et al teach all the claimed limitations except a type of bonding between the first and second layer and dicing a composite wafer (bonded first and second layer). Using any type of known bonding including soldering, epoxy and anodic bonding would have been obvious to use in Konishi et al to attach two layers together. Kakii et al teach making a plurality of optical fiber coupling member by dicing substrate plate wafer comprising optical fiber coupling members into a plurality of chips of optical fiber coupling members. It would have been obvious to one having ordinary skill in the art at the time the invention was made to use the method of dicing the wafer into a plurality of chips of optical coupler for massive production of couplers with low manufacturing cost.

Conclusion

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16. The prior art documents submitted by applicant have been considered and made of record (note the attached copy of form PTO-1449).

17. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Sheem (U.S. Patent 5,633,968) teaches using substrates to interconnect optical components including optical fibers, waveguide channels, light sources, detectors and lenses. Okuda et al (U.S. Patent 6,267,515 B1) teaches an optical coupling module (see Fig. 18).

18. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Juliana K. Kang whose telephone number is (571) 272-2348. The examiner can normally be reached on Mon. & Fri. 10:00-6:00 and Tue. & Thur. 10:00-3:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Rod Bovernick can be reached on (571) 272-2344. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


JULIANA KANG
PRIMARY EXAMINER